

AMENDMENTS TO THE DRAWINGS

The attached sheet(s) of drawings includes changes to Figure 6.

Attachments: Replacement Sheet

REMARKS

Claims 12-20 are currently pending in the application, of which claims 12 and 18 are in independent form.

Claims 12 and 18 have been amended for clarity, and not in response to any objection or rejection to the claims. No claims have been added or cancelled. Claims 1-11 are withdrawn in accordance with the restriction requirement dated April 9, 2008.

Objection to the Drawings

The Office Action indicates that Figure 6 does not show a consistent outside diameter of the core material for each shaft in the family of shafts. Figure 6 has been amended to illustrate that the outside diameter of the core material is consistent from one shaft to another at corresponding locations.

Objection to the Specification

The Office Action alleges that the Specification is not written such that one skilled in the art is enabled to make and/or use the claimed invention because the stiffness of the angle-ply materials applied to the shaft may have a longitudinal vector. Applicants acknowledge that a longitudinal vector exists for the angle-ply material; that vector, however, is so small in comparison with the longitudinal stiffness imparted by the zero-play materials as to be considered negligible by one skilled in the art. More precisely, fibers oriented in a +/- 45 degree orientation (hence called angle-ply) in relation to the longitudinal axis of the shaft have a negligible effect on longitudinal stiffness. This has to do with how the fibers behave. As far as stiffness behavior, these fibers impart stiffness in the orientation in which they are laid. Laminates are oriented in a +/- 45 degree fashion in order to affect torque, or the twisting of the shaft. The force vector of fibers in the angle-ply laminate is at this 45 degree orientation, and this vector is the resultant vector of both a longitudinal and vertical vector. Thus, the "core of composite angle-fiber-and-resin material" recited in claims 12 and 18 affects torsional stiffness (i.e., torque, or the twisting of the shaft) rather than longitudinal stiffness. While the angle play

slightly affects longitudinal stiffness, the effect is so small that it is considered negligible by those having skill in the art. Finishing operations make the affect even more negligible. If the examiner is aware of prior art that teaches the contrary, Applicants request that the Examiner provide such prior art.

In view of these arguments and amendments, Applicants respectfully request that Examiner withdraw the Objection to the Specification.

Rejections under 35 U.S.C. § 112, first paragraph

Claims 12-20 are rejected under 35 U.S.C. § 112, first paragraph as failing to enable one skilled in the art to make and produce the invention because claims 12 and 18 allegedly do not recite a method to produce a family of shafts having the same longitudinal bending stiffness. The Office Action expresses the view that the “core of composite angle-fiber-and-resin material” provides a longitudinal vector which affects the longitudinal bending stiffness. Applicants respectfully disagree.

As amended, independent claims 12 and 18 recite, in part, “a shell of composite longitudinal-fiber-and-resin material having a preselected amount of longitudinal-fiber-and-resin material that produces said same longitudinal bending/stiffness profile in each shaft of the family.” As discussed above in connection with the Objection to the Specification, the “core of angle-fiber-and-resin material” provides negligible longitudinal stiffness to the shaft. Applicants submit that the “shell of composite longitudinal-fiber-and-resin material having a preselected amount of longitudinal-fiber-and-resin material” recited by the claims provides “the same longitudinal bending/stiffness profile for each shaft.” Thus one skilled in the art is enabled to make and/or use a family of shafts having the same longitudinal bending stiffness.

Applicants respectfully request withdrawal of the §112, ¶ 1 rejection and reconsideration of claims 12-20.

Rejections under 35 U.S.C. § 112, second paragraph

The Office Action rejects claims 12-20 as indefinite under 35 U.S.C. § 112, second paragraph because they appear to conflict with Fig. 6 regarding the outside size of the core in the family of shafts.

As discussed above, Fig. 6 has been amended to illustrate a family of shafts having cores with the same or substantially the same outside diameter for shafts of different weights. No new matter is added, as Fig. 6 is consistent with the specification and claims. Applicants respectfully request withdrawal of the §112, ¶ 2 rejection and reconsideration of claims 12-20.

Rejections under 35 U.S.C. § 102

The Office Action rejects claims 12 and 18-20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,273,830 issued to Takemura et al. (hereinafter “Takemura”). However, Takemura does not set forth each and every element of the rejected claims, either expressly or inherently. (*See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP § 2131). Thus, the rejection is respectfully traversed.

Independent claims 12 and 18 variously recite, in part, that “the preselected weight of angle-fiber-and resin material in each shaft of said family [is] different from the preselected weights in the other shafts of the family.” Moreover, “the core of each shaft [has] an outside surface that is maintained substantially the same size to maintain the same size shell in each shaft.” Takemura does not disclose at least this combination of features.

Takemura discloses several examples of methods to construct a shaft, wherein two different prepreg materials for forming the angle layers are disclosed in the examples. (e.g., P9055F-11 and P9055F-13) The examples indicate that the carbon fibers corresponding to the prepreg materials have different weights (e.g., 100g/m² in Example 1 vs. 125 g/m² in example 2), thus implying that the angle materials may have different weights. However, Takemura does not disclose compensation for the difference in outside diameter that results from using these

different-weighted materials in one shaft versus another. Hence, Takemura does not disclose that the outside surface of the angle layer of each shaft is “maintained substantially the same size”. Nor does Takemura disclose that the same size shell is maintained in each shaft as a consequence of the outside surface size of the core for each shaft being the same. On the contrary, Takemura indicates that the outside surface size may range significantly. Table 3 of Takemura discloses a variety of mandrels used in preparation of shafts, wherein the “Butt diameter” of the mandrels ranges from 14.55mm to 16.20mm, and includes a variety of taper profiles. Presumably, this range of mandrel sizes results in the disclosed “outer diameter of the butt end portion of the shaft in the range of 14.5 mm to 18 mm.” (Col. 9, lines 16-18.) Clearly, the “same size shell” is not maintained in each shaft.

As Takemura does not disclose every element of at least independent claims 12 and 18, independent claims 12 and 18 are believed to be in condition for allowance. Claims 19-20 depend from claim 18 and are, therefore, also believed to be in condition for allowance, for at least the same reasons as claim 18. Withdrawal of the § 102 rejection and reconsideration of the claims are respectfully requested.

Rejections under 35 U.S.C. § 103

The Office Action rejects claim 14 under 35 U.S.C. § 103(a) as being unpatentable over of Takemura. This rejection is respectfully traversed.

Claim 14 depends from claim 12, and is thus believed to be in condition for allowance for at least the same reasons as claim 12, discussed above. Withdrawal of the § 103 rejection and reconsideration of claim 14 are respectfully solicited.

Conclusion

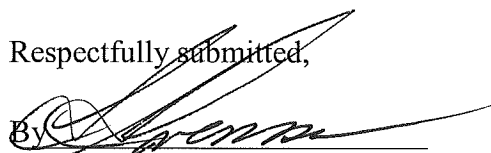
In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at telephone No. (858) 792-8855, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

By 

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Attachments